METHOD TO TRIGGER DEVICES BASED ON THEIR LOCATION

BACKGROUND

[0001] 1. Field

[0002] Communication systems including the evolved packet system can include machine type communication. Location device triggering can be a feature related to machine type communication (MTC) and can also be applied to other areas, such as public safety networks. In this feature, the network can initiate a trigger to the device, such as MTC devices, based on area information provided to the network operator.

[0003] 2. Description of the Related Art

[0004] The evolved packet system (EPS), the successor of general packet radio system (GPRS), provides radio interfaces and packet core network functions for broadband wireless data access. EPS core network functions include the mobility management entity (MME), the packet data network gateway (PDN-GW) and the Serving Gateway (S-GW). An example of an evolved packet core architecture is illustrated in FIG. **1** and is described by third generation partnership project (3GPP) technical specification (TS) 23.401, which is incorporated herein by reference in its entirety. A common packet domain core network can be used for both radio access networks (RANs), the global system for mobile communication (GSM) enhanced data rates for GSM evolution (EDGE) radio access network (GERAN) and the universal terrestrial radio access network (UTRAN).

[0005] For machine-type-communication (MTC) a functional entity called MTC interworking function (MTC-IWF) and several new interfaces, including S6m, Tsp, Tsms, T5a/b/c and T4, have been introduced to the 3GPP architecture. FIG. **2** illustrates machine-type-communication additions to the 3GPP architecture, as well as the various interfaces identified. The MTC-IWF and the new interfaces in 3GPP Release 11 (Rel 11) can, for example, enable triggering of devices with or without a mobile subscriber integrated services digital network number (MSISDN) from an internal or external MTC server. The triggering of the devices may be, for example, in order to establish a packet data network (PDN) connection and/or packet data protocol (PDP) context. A 3GPP architecture for machine-type communication is discussed in 3GPP TS 23.682, which incorporated herein by reference in its entirety.

[0006] Cell broadcasting service is one technique that may be used to trigger non-attached MTC devices based on location information provided by an MTC user.

SUMMARY

[0007] According to certain embodiments, a method includes triggering a group of devices using a triggering request. The triggering request includes at least one of geographic information or a group identifier based on geographic information.

[0008] In certain embodiments, a method includes receiving a request to trigger a group of devices, wherein the triggering request comprises at least one of geographic information or a group identifier based on geographic information. The method also includes determining at least one serving node based on the geographic information when the triggering request geographic information. The method further includes sending a device trigger request including at least one of a tracking area identifier, a cell identifier, or the group identifier.

[0009] An apparatus, in certain embodiments, includes at least on processor and at least one memory including computer program code. The at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus at least to trigger a group of devices using a triggering request. The triggering request includes at least one of geographic information or a group identifier based on geographic information.

[0010] An apparatus, according to certain embodiments, includes at least on processor and at least one memory including computer program code. The at least one memory and the computer program code are configured to, with the at least one processor, cause the apparatus at least to receive a request to trigger a group of devices, wherein the triggering request includes at least one of geographic information or a group identifier based on geographic information. The at least one memory and the computer program code are also configured to, with the at least one processor, cause the apparatus at least to determine at least one serving node based on the geographic (geo) location coordinates or cell ID or tracking area identifier when the triggering request includes geographic (geo) location coordinates. The at least one memory and the computer program code are further configured to, with the at least one processor, cause the apparatus at least to send a device trigger request including at least one of a tracking area identifier, a cell identifier, or the group identifier.

[0011] According to certain embodiments, an apparatus includes triggering means for triggering a group of devices using a triggering request. The apparatus also includes receiving means for receiving a response to the triggering request. The triggering request includes at least one of geographic information or a group identifier based on geographic information.

[0012] In certain embodiments, an apparatus includes receiving means for receiving a request to trigger a group of devices. The triggering request includes at least one of geographic information or a group identifier based on geographic information. The apparatus also includes determining means for determining at least one serving node based on the geographic information when the triggering request geographic information. The apparatus further includes sending means for sending a device trigger request including at least one of a tracking area identifier, a cell identifier, or the group identifier.

[0013] A non-transitory computer readable medium in certain embodiments is encoded with instructions that, when executed in hardware, perform a process. The process includes triggering a group of devices using a triggering request. The triggering request includes at least one of geographic information or a group identifier based on geographic information.

[0014] A non-transitory computer readable medium according to certain embodiments is encoded with instructions that, when executed in hardware, perform a process. The process includes receiving a request to trigger a group of devices, wherein the triggering request comprises at least one of geographic information or a group identifier based on geographic information. The process also includes determining at least one serving node based on the geographic information when the triggering request geographic information. The process further includes sending a device trigger request